

CLAIMS

1. A fuel injection system for an engine, the fuel injection system comprising:

a fuel pressure boost pump having a pump body that defines a pump cylinder and a pump chamber,

a piston structure in the pump cylinder and movable therein along a longitudinal axis of the piston structure,

a fuel inlet conduit in flow connection with the pump chamber, the fuel inlet conduit being provided with a first one-way valve,

a fuel outlet conduit in flow connection with the pump chamber, the fuel outlet conduit being provided with a second one-way valve, and

a temperature sensor in thermally conductive contact with the pump body.

2. A fuel injection system according to claim 1, further comprising a measurement means for receiving a signal generated by the temperature sensor and measuring a characteristic of the signal to provide temperature data, and an analysis apparatus for receiving the temperature data and comparing the temperature data with a threshold value.

3. A fuel injection system according to claim 1, wherein the temperature sensor is located in a bore in the pump body.

4. A fuel injection system according to claim 1, wherein the temperature sensor is located adjacent the pump chamber, or adjacent a channel formed in the pump body and connecting the pump chamber to the fuel outlet conduit, or adjacent the second one-way valve.

5. A fuel injection system according to claim 1, comprising a plurality of fuel pressure boost pumps each having a pump body, and also comprising a plurality of temperature sensors in thermally conductive contact with the pump bodies respectively, a measurement means for receiving signals generated by the temperature sensors respectively and

measuring a characteristic of the signals to provide temperature data for the pumps respectively, and an analysis apparatus for receiving the temperature data and comparing the temperature data.

6. A fuel injection system according to claim 5, wherein each pump has a fuel outlet conduit and the system further comprises a means defining a pressure accumulator space to which the fuel outlet conduits are connected.

7. A fuel injection system according to claim 6, wherein the means defining the pressure accumulator space comprises a plurality of pressure accumulator vessels to which the fuel outlet conduits are respectively connected and a pressure equalization conduit connecting the vessels.

8. A method of operating a fuel injection system for an engine, the fuel injection system comprising a fuel pressure boost pump having a pump body that defines a pump cylinder and a pump chamber, a piston structure in the pump cylinder, a fuel inlet conduit in flow connection with the pump chamber, the fuel inlet conduit being provided with a first one-way valve, and a fuel outlet conduit in flow connection with the pump chamber, the fuel outlet conduit being provided with a second one-way valve, the method comprising driving the piston structure to move in the pump cylinder for executing alternately a suction stroke, in which fuel flows into the pump chamber by way of the first one-way valve, and a pressure stroke, in which fuel flows from the pump chamber by way of the second one-way valve, and measuring the temperature of the pump body.

9. A method according to claim 8, comprising measuring rate of change of the temperature of the pump body, comparing the rate of change of the temperature of the pump body with a preset maximum value, and activating an alarm in the event that the measured rate of change exceeds the preset maximum value.

10. A method according to claim 8, wherein the fuel injection system comprises a plurality of fuel pressure boost pumps each having a pump body, and the method comprises measuring the temperature of each pump body, comparing the temperature of a first pump body with the temperature of a second pump body, and activating an alarm in the event that the measured temperature of the first pump body exceeds the measured temperature of the second pump body by a preset amount.

11. A method according to claim 10, comprising measuring the temperature of each pump body at regular intervals.

12. A method according to claim 8, comprising measuring the temperature of the pump body at regular intervals.